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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,458	01/04/2007	Vesa Myllymaki	0696-0228PUS1	1010

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EXAMINER	
QIAN, YUN	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/568,458	MYLLYMAKI ET AL.	
	Examiner	Art Unit	
	YUN QIAN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-20 remain for examination. Claim 7 is amended.

Previous Grounds of Rejection

Regarding claims 1-6, 12,14 and 19, the provisionally rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 8-10, 12-15 and 17 of copending Application No.10/585,055 stands.

Regarding claims 1-20, the rejection under 35 U.S.C. 103(a) as being unpatentable over Bergstrom et al. (US 4,000,032) in view of Swatloski et al. (WO 03/029329), in further view of Gutowski et al. PCT/AU01/00100 stands.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6, 12, 14 and 19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 8-10, 12-15 and 17 of copending Application No.10/585,055. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-3, 8-10, 12-15 and 17 of the copending Application No. 10/585,055 teaches a method for depolymerization starch with an ionic liquid assisted in microwave irradiation and/or pressure. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of copending Application No. 10/585,055, because both of them teach treatment for long chain polymeric polysaccharide carbohydrate and would have a reasonable of expectation of success.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom et al. (US 4,000,032) in view of Swatloski et al. (WO 03/029329), in further view of Gutowski et al. PCT/AU01/00100 (herein referred to under the equivalent of US 2003/0157268).

Regarding claim 1, Bergstrom et al. teaches a process for disrupts or destroys (depolymerization) the natural structure of the lignocellulosic material, which comprising microwave irradiation. If desired, superatomspheric and subatomspheric pressures can be used (Abstract, col. 4, lines 43-49. col.5, Example, claims 9-10).

However, Bergstrom et al. does not specifically teach dissolving lignocellulosic material in an ionic liquid solvent as per applicant claim 1.

Swatloski et al. teaches a method for dissolving cellulose in an ionic liquid absence of water via an admixing and microwave irradiation at <150 ^{0}C (claims 1-3 and 6).

Gutowski et al. points out that cellulose never occurs in pure form, instead it is usually embedded in ligocellulose (an amorphous matrix of hemicellulose and lignin containing ordered cellulose), making up the cell walls of fibers such as found in wood (well-developed matrix) and cotton (matrix of almost vanishing magnitude) ([0055]).

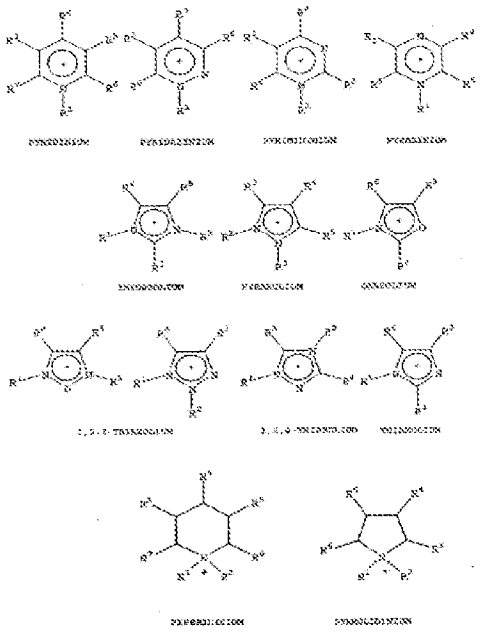
It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bergstrom et al. and Swatloski/Gutowski et al. to obtain the invention as specified in the claim 1, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. Page 3 and page 29).

Regarding claim 2 as discussed above, the process taught by Swatloski et al. applies microwave irradiation to assist in dissolution (claims 1-3).

Regarding claim 3 as discussed above, the process taught by Bergstrom et al. comprises the use of superatomspheric and subatomspheric pressures to assist in dissolution (col. 4, lines 43-49. col.5, Example, claims 9-10).

Regarding claim 4, the ionic liquid solvent taught by Swatloski et al. is molten at a temperature of <150 ^{0}C (claim 6). It is encompassed by the recited claim.

Regarding claims 5-6, 11, 15, 17 and 20, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



The cation comprises imidazolium and the anion is halogen. It meets the claimed limitations (page 5, and claim 55).

Regarding claims 7-8, the process taught by Bergstrom et al. is applicable to any type of lignocellulosic materials such as softwood (pine) and hardwood (oak) as in the recited claim (col.3, lines 9-20, col.5, Example).

Regarding claim 9 as discussed above, the ionic liquid solvent taught by Swatloski et al. is substantially free of water (claims 1-3).

Regarding claim 10, the cellulose taught by Swatloski et al. is present in amount of about 10% to 25% wt of the solution (claim 37). It is encompassed by the recited claim.

Regarding claims 12 and 14, the process for dissolving and regenerating cellulose taught by Swatloski et al. comprises steps of (a) dissolving cellulose in an ionic liquid solvent in the substantial absence of water under microwave irradiation at about 120 ^{0}C, (b) forming solid and liquid phases (precipitating the cellulose) by adding a liquid non-solvent such as water, alcohol or ether, (c) collecting the formed cellulose (Example 3, page 24, and claims 1-3 and 52-60).

Regarding claims 13, 16 and 18-19, Gutowski et al. teaches an extraction of non-cellulosic resinous materials assisted by exposing the cellulosic material to microwave and/or other suitable solvents. The extraction typically includes suitable chemicals capable of at least partly extracting one or more of the lignin, phenolic gums and other extractive materials ([0031], claims 3-4).

Response to Arguments

With regards to the previous Grounds of Rejection

Applicant's arguments filed October 22, 2009 with respect to claims 1-20, have been considered but are not persuasive. The examiner would like to take this opportunity to address the Applicant's arguments.

In response to applicant's argument that Bergstrom et al. fails to teach completely dissolving lignocellulosic material in ionic solvent in the absence of water (Remarks, pages 11-12), the Examiner respectfully submits that Bergstrom et al. teaches a process that disrupts or destroys the lignocellulosic material, which comprising microwave irradiation.

However, Bergstrom et al. does not specifically teach dissolving lignocellulosic material in an ionic liquid solvent as per applicant claim 1.

Because, note that while Bergstrom et al. do not disclose all the features of the present claimed invention, it is not necessary for this reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981).

Swatloski et al. teaches a method for dissolving cellulose **in an ionic liquid absence of water** via an admixing and **microwave irradiation** at <150 ^{0}C (claims 1-3 and 6).

Gutowski et al. points out that cellulose never occurs in pure form, instead it is usually embedded in ligocellulose (an amorphous matrix of hemicellulose and lignin containing ordered cellulose), making up the cell walls of fibers such as found in wood (well-developed matrix) and cotton (matrix of almost vanishing magnitude) ([0055]).

Therefore, Bergstrom et al. teaches a certain concept, namely a process for disrupts or destroys the lignocellulosic material, and in combination with the references of Swatloski/Gutowski et al. (teachings of the use of ionic liquid solvent in the absent of water under microwave irradiation to assist in dissolution) discloses the presently claimed invention, motivated by the fact that the use of ionic liquids as replacements for conventional organic solvents in chemical, biochemical and separation processes prevents pollution and waste production, and utilizes renewable resources (Swatloski et al. at page 3 and page 29).

Since the references, as combined, teach all of the claimed reagents and composition, the physical properties of the resulting lignocellulosic mixture (i.e. forming a homogenous solution, depolymerization) would necessarily follow as set forth in MPEP 2112.01(II).[1]

In response to applicant's argument that Swatloski et al. does not contain any teaching or motivating for dissolving lignocellulosic material in ionic liquid, and the cellulose containing lignocellulosic material taught by Swatloski et al. is different from the lignocellulosic material used in the present application(Remarks, pages 13-14).

The Examiner respectfully disagrees. As discussed above and set forth in the office action mailed on June 22, 2009, Swatloski et al. teaches a method for dissolving cellulose in an ionic liquid absence of water via an admixing and microwave irradiation. Cellulose never occurs in pure form (taught by Gutowski et al.) and contains ligocellulose. Therefore, Swatloski et al. implicitly teaches dissolving lignocellulosic material in ionic liquid.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features, upon which applicant relies (i.e. lignocellulosic material which has not been subjected to a pulping or defibering process) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read

[1] "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)

into the claims. See *In re Van Geuns,* 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, the rejection stands.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUN QIAN whose telephone number is (571)270-5834. The examiner can normally be reached on Monday-Thursday, 10:00am -4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YUN QIAN/
Examiner, Art Unit 1793

February 9, 2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793